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(71) Applicant(s) Candasamy Rajendran 16 Wanless Terrace, DURHAM CITY, DH1 1RU, United Kingdom	(56) Documents Cited Chemical Abstracts 129:229940
(72) Inventor(s) Candasamy Rajendran	(58) Field of Search UK CL (Edition R) A5E EAB ECF ECG INT CL ⁷ A01N 25/08 25/10 25/34 63/00 63/02 63/04 65/00 Online: WPI,EPODOC,JAPIO,CAS ONLINE
(74) Agent and/or Address for Service Candasamy Rajendran 16 Wanless Terrace, DURHAM CITY, DH1 1RU, United Kingdom	

(54) Abstract Title
Kombucha tea mushroom in controlled release of bioactive compounds

(57) Kombucha tea is a beverage long used in China and is attributed to have a number of features that promotes good health. It is produced by a group of microorganisms using tea and sugar. During fermentation a jellylike mushroom made up of cellulose is formed on the surface of the tea. Kombucha tea mushroom can also be produced by growing the microorganisms in waste water from vegetable, fruit or dairy industry. This mushroom is used as matrix to incorporate bioactive materials in controlled release of bioactive compounds. The Mushroom is oven dried and soaked in solutions of bioactive compounds or when fresh homogenised and mixed with active ingredients. This is then made into pellets or made into sheets and dried and used in pest control or delivery of medicine.

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The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

KOMBUCHA TEA MUSHROOM IN CONTROLLED RELEASE OF BIO ACTIVE COMPOUNDS

BACKGROUND

Kombucha tea is a fermented tea. It originated in China during Tsin Dynasty (220 BC). This tea was first used for its healing properties in the Far East. During fermentation of kombucha tea, a soft pancake like structure appears on the surface of the tea. This is a polysccharide, (kombucha tea mushroom) consisting mainly of cellulose and acetan and is used in controlled release of bioactive compounds.

CONTROLLED RELEASE OF BIO ACTIVE COMPOUNDS

Farmers today depend on agro chemicals to increase crop production. Over use of some of these chemicals have lead to increased resistance by some pest. Thus the farmer has to use more chemicals to have the same desired effect. This practice is wasteful and leads to an overload of chemicals in the environment with its the subsequent social and economic problems. One solution to this is to deliver the agro chemicals at the right dose at the right time. This is called controlled release. In controlled release bioactive compounds are embedded in a matrix and released from it at a predetermined dose and rate. For this purpose a number of different materials are been used. Some of the common ones are calcium carbonate, polyethylene, ethylene vinylacetate, natural rubber and kraft lignin. Of these, lignin is the preferred option. This is because it is a natural product. There are specific soil microbes that break down different types of organic matter. However eg. cellulolytic microbes can only break down cellulose and not lignin. Therefore a matrix that releases the bio active compound at the required dose and frequency and at the same time gets denatured by soil microbes will be of great advantage to both farmers and conservationists.

Kombucha tea mushroom is one such material that can be used in controlled release of bioactive compounds.

PRODUCTION OF KOMBUCHA TEA MUSHROOM

Kombucha tea mushroom is a by product of fermentation of kombucha tea and sugar. To prepare kombucha tea, three pints of water is boiled in an enamel vessel and six tea bags and six ounces of sugar is left to simmer for about 10 minutes. The tea bags are removed and the tea left to cool to room temperature. When it has cooled, a piece of kombucha tea mushroom is put in to the tea as a starter. The vessel is covered with a cloth and left in a cupboard undisturbed for a bout 10 days. During this time a soft pancake like mushroom develops on the surface of the tea. This matrix is used in controlled release formulations.

CONTROLLED RELEASE FORMULATION

The method used for controlled release formulation is as follows: The kombucha tea mushroom is removed from the vessel and air dried. This is then cut into small pieces or used as sheet. A known water soluble pesticide is dissolved in water and these pieces of dry kombucha mushroom or sheet is placed in it. The dry kombucha matrix absorbs the pesticide solution . These pieces are dried in air and is used directly in crop protection. Another method used was to grow the kombucha tea mushroom in a solution of pesticides. The mushroom incorporates the pesticide. This is then dried cut up into convenient size or used as a sheet in crop protection.

KOMBUCHA TEA MUSHROOM IN CONTROLLED RELEASE OF BIOACTIVE COMPOUNDS

CLAIMS

1. Kombucha tea mushroom is a jellylike structure consists of cellulose and some water with the microorganisms. This is a by product of fermentation of tea and sugar by a group of microorganisms and it floats on the surface of the tea. This cellulose is used as a matrix to incorporate bioactive compounds used in controlled release of bioactive materials in pest control and delivery of drugs.
2. Microorganisms will produce cellulose when grown in waste water from vegetable, fruit and dairy industry.
3. The microorganisms in kombucha tea mushroom (claim 1) will grow in tap water, rain water and stream water when provided with sucrose, glucose or fructose.
4. Kombucha tea mushroom (claim 1) can be dried in an oven and then soaked in solutions of bioactive compounds.
5. Fresh kombucha tea mushroom can be homogenised and bio active compounds mixed with it. After thoroughly mixing with the bioactive material it is pressed into sheets or as pellets and oven dried for use in controlled release in pest control or drug delivery.



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Claims searched: 1 at least

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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

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Other: Online: WPI, EPODOC, JAPIO, CAS ONLINE

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	Chemical Abstracts 129:229940	1 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.